CHAPTER 9

Academic Pressures

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INTRODUCTION

Decisions about whether research fraud occurs because of academic pressures can be made only after thoroughly understanding the immense variability in the definitions of fraud. Also, the wide variability in the estimates of the frequency of research fraud attributable to academic pressures appears to be related to the lack of an agreed-upon definition. This chapter will begin with a brief overview of the various definitions and prevalence estimates of fraud. Possible reasons for fraud related to academic pressures will be explored next. We will conclude with a section on directions for future research and suggestions for minimizing the incidence of fraud caused by academic pressures.
Definitions

The term research fraud has certain legalistic overtones that imply intent to deceive (DuBois, 1989), intentional misrepresentation (Engler, Covell, Friedman, Kitcher, & Peters, 1987), and carried with it the possibility of punitive consequences from outside the academic arena. Research fraud also implies gross mismanagement of the research endeavor (e.g., wanton and flagrant misuse of government funds). On the other hand, the types of activity that are considered to be incidents of research fraud have been viewed on a much wider continuum. Such variability seems to be captured in a related term that is used to describe fraudulent behaviors, as well as problems of misconduct and misrepresentation, intellectual dishonesty in science (Garfield, 1987, p. 3).

Garfield (1987) noted that various authors have drawn an obvious distinction between fraud and intellectual dishonesty or misrepresentation. Engler et al. (1987) made three distinctions. Inaccurate statements could be made:

1. through justifiable mistakes—cases in which the scientist had no knowledge or basis for believing that the statements he or she was making were incorrect; 2. through careless errors—cases in which the scientist had no intent to deceive but the information that would have provided reason to doubt the accuracy of the statements made was available; and 3. through fraud—cases in which the statements made were known by the scientist to be false and in which the scientist intended to deceive others. Justifiable mistakes do not raise the issue of culpability. Careless errors and fraud involve a range of culpable actions, from negligence in the supervision of research or the execution of experiments to a clear intent to deceive. (pp. 1383–1384)

Although their definition appears to be somewhat concrete, making reliable classifications of specific behavior would be difficult. Blakely, Poling, and Cross (1986) noted two reasons that “make it difficult to discern whether a scientist’s behavior involves premeditated intent to deceive” (p. 319). First, intent to deceive can only be inferred and not directly assessed. An individual who knowingly intends to commit fraud or misrepresentation will not only likely make attempts to cover up the incident(s) but also not admit to it later. Second, the individual may not be “aware of” or be able to report his or her fraudulent or unethical behavior. Although Blakely et al. (1986) provide an interesting “behavioral” description of how this may occur, they suggest that this type of behavior could be referred to as repression. For the above reasons, we will consider the larger gamut of behavior that may be subsumed under the terms fraud or intellectual dishonesty rather than behavior that represents a narrow definition of fraud (i.e., an intention to deceive).

Table 9.1 includes a variety of activities that have been labeled, or could be considered, as research fraud, intellectual dishonesty, misconduct, or misrepresentation. Huth (1986) noted that some abuses may not be “dramatically unethical” (p. 258). Indeed, “the scientific community might not ever agree on whether repetitive and duplicative publication are unethical. Wasteful publication might be seen as jus-

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tified by needs to compete for institutional and financial support to ensure academic survival” (Huth, 1986, p. 258, emphasis added). If “mild” cases of misrepresentation are viewed as acceptable or justifiable forms of behavior, it is easy to see how this viewpoint can lead to the assumption that fraud or more serious forms of misrepresentation may become necessary in view of academic pressures. The problem becomes more pronounced with the consideration that some individuals are unaware of the extent to which their actual behavior or practices deviate from accepted behavior or practices (DuBois, 1989; Mishkin, 1988). For example, Mishkin (1988) described an individual who was totally unaware of how his behavior deviated from generally accepted practice. She noted, “It seemed he believed (among other things) that it was permissible to draw graphs and charts before he had collected the data the figures were supposed to illustrate” (p. 1933). By considering the broadest definition of fraud, intellectual dishonesty, or potentially unethical behavior here, we can more easily postulate how academic pressures may play a role in their occurrence.

PREVALENCE

There is no known data base that would provide an estimate of the prevalence of fraud or misconduct in science. Broad and Wade (1982) indicate that there have only been 34 cases of fraud reported or strongly suspected from the second century through the early 1980s. Miers (1985) noted that the number of cases of misconduct in NIH-funded research is “almost insignificant” (p. 831) given the volume of funded research. However, Koshland (1987) noted that some newspaper reports suggest a much higher rate of fraud without mentioning that the amount of research conducted since the 1800s has grown exponentially. There are no data that would support an increased percentage of fraud today as opposed to 100 years ago. Miers (1985) offers relevant observations.

There is no question that the incidence of reported misconduct has increased dramatically. In the past three years, NIH has received an average of two reports per month of possible misconduct that appears to go beyond the traditional kinds of issues encountered in the fiscal and administrative management of grants, cooperative agreements, and contracts. About half of the reports have proven to be factual. Some of those reflected not fraudulent intent but some error in methodology or sloppy technique. Others appeared to be the result of the failure to develop and communicate appropriate policies and internal controls within academic and research institutions. The reports of misconduct cover a full range of behaviors. A few have involved possible egregious misuse of funds, but the majority are concerned with departures from accepted research practices, including fabrication, misrepresentation or selective reporting of results, inadequate attention to the rights of human subjects, and unacceptable treatment of laboratory animals. (p. 831)

As noted earlier, by broadening the definition of the types of behaviors that are being considered in this discussion, there may appear to be a greater prevalence of problematic behaviors in the academic endeavor. Petersdorf (1989) noted that fraud and misconduct have become major problems for both science and medicine:

It has been suggested that products of the system in which dishonesty is conducted are fair game to be seduced by the pressures of academia: the pressure to excel, the pressure to produce, the pressure to publish, the pressure to be promoted, and the pressure to cope with that academic albatross, the need to achieve tenure. Whether there is a connection between the early professional environment and research fraud is not clear. What is clear is that fraud is a major affliction of science and medicine. (p. 121)

For these reasons, it is clear that a thorough analysis should be conducted of the various academic pressures that may contribute to fraud or misconduct. The following sections explore the possible reasons for fraudulent research by academics. Specifically, what is the nature and extent of pressure in academia? What qualities within individuals might contribute to heightened stress or fraudulent behavior? And, finally, what external circumstances might increase academic pressure? Of course, factors within the individual can interact with external circumstances to increase academic pressure. The research cited in this section often covers the entire spectrum of faculty who are employed in a university setting. Most of the studies and reports would have to be excluded if we reviewed only those that are of particular interest in this volume.
EXTENT OF STRESS AND PRESSURE IN ACADEMIA

Faculty responses to 23 items that assessed various aspects of morale revealed that a plurality of the respondents indicated that they experienced low morale (Hunter, Ventimiglia, & Crow, 1980). In a study of academic and applied psychologists, Boice and Myers (1987) reported that the academics had higher levels of health-related concerns, such as sadness and insomnia, than did the applied psychologists.

In contrast to these studies, two surveys indicated that academic faculty reported no more signs of stress than nonacademic control groups. Although 60% of the academic faculty showed physical signs (e.g., headaches) of stress, this was not significantly different from personnel in the student affairs office (Brown et al., 1986). Similarly, there was no significant difference on a measure of overall job stress between university faculty and a control group, matched on demographic variables (Horowitz, Blackburn, Edington, & Kloss, 1988). Finally, a study by Frazier, Morrow, & Thoreson (1990) reported no gender differences among faculty in level of performance, but females reported more stress than males.

Based on this research, it would appear unclear whether university faculty experience more stress than people in other work settings. However, it is possible to infer from the research that university faculty experience a high level of work stress. This might be particularly the case for female faculty.

PSYCHOPATHOLOGY AS A CAUSE OF STRESS

One approach to the problem of research fraud has been to suggest that the fraudulent person has some significant psychological and/or developmental problem. Based on this view, fraudulent behavior stems not so much from the circumstances that may generate high levels of stress, but instead from the psychological problems within the individual. The fraudulent behavior is a manifestation of those psychological difficulties.

One view of the problem of research fraud is to consider that a person who commits fraud is sick and to medicalize the problem.

Viewing the behavior as a sickness absolves the fraudulent person of responsibility for his or her actions (Fox, 1977). In contrast to Fox (1977), Woolf (1981) argued that research fraud is a form of psychopathic behavior. Presumably, researchers who commit fraud do so, not so much out of great pressure, but because it is an expedient way to reach their goals, and they perform this fraudulent behavior with little or no remorse. Knight (1984) questioned the explanation of fraud as psychopathic behavior and, instead, suggested that those who commit fraud have failed to reach the highest level of moral development.

Although not writing specifically about research fraud; Mahoney (1979) has had a different view of researchers and what makes them function as they do. Mahoney has argued that scientists are not always objective or open-minded in pursuing their research work. The tendency to be biased and to perceive selectively may be one reason why university faculty engage in fraudulent behavior.

PERSONALITY CHARACTERISTICS

In this section we will consider personality characteristics that may be associated with experiencing and reporting job stress. Several studies have been designed to examine performance and expectations among faculty as they might relate to stress. Brown et al. (1986) reported that 22% of the 191 faculty surveyed indicated high self-expectations. In a study of 1920 faculty, 53% indicated high self-expectations (Gmelch, Lovrich, & Wilke, 1984). Furthermore, there was a positive association between high self-expectations and high reported stress. Stumpf and Rabinowitz (1981) investigated the relationship between performance and job satisfaction at the various rank levels. The authors found that the high performers were the least satisfied, but this was true only among senior faculty. No such relationship was found among the junior faculty. These data were discussed by the authors in terms of the possible high expectations of some of the senior faculty resulting in both high performance and reduced satisfaction.

The research and theory on locus of control might suggest that "internals" would feel more in control of their work environment than "externals" and therefore more satisfaction with their job. This prediction was affirmed in a study by Shukla and Upadhyaya (1986).
Other researchers have studied a variety of personality attributes that might be related to job stress. Seiler and Pearson (1984) studied accounting educators. Their measure of stress contained several components (e.g., depression, physical exhaustion). Faculty who showed low self-confidence, inactivity, and low assertiveness reported higher levels of stress. Those who were goal-oriented reported higher levels of stress than their less goal-oriented counterparts. These data are somewhat consistent with the previously mentioned research concerning the positive association between self-expectations and reported stress. It might be inferred that goal-oriented people would have high self-expectations. On the other hand, those who are confident, active, and assertive may feel a greater sense of control in their environment and, therefore, feel less stressed. This observation would be consistent with the research on locus of control.

The final report to be reviewed in this section concerns another study with accounting educators (Seiler & Pearson, 1984). These authors reported that high-stress individuals, compared with low-stress individuals, showed more impatience, assertiveness, workaholism, and idealism. Again, there is some consistency in terms of behavior that is similar to Type A behavior and the indication of high self-expectations, which are all related to high stress.

The research reviewed here suggests that certain people may be more vulnerable to stress than other people, regardless of the circumstances in the work environment. We turn now to several aspects of the academic work environment that might contribute to stress among university faculty.

CIRCUMSTANCES CONducIVE TO STRESS

Even before taking an academic position, aspiring academics receive the message that they must be prolific in research. In a national survey of all PhD-granting experimental psychology programs, there was a significant increase (from 1982 to 1987) in the number of publications authored by the new PhDs that were employed (Follette & Klesges, 1988).

Medical students soon learn that fierce competition and pressure are a part of their schooling environment. Petersdorf (1986) has described the intense competition of the premed majors, which contin-

ues in medical school. This pressure may well be an important factor in the finding that 88% of the premed students surveyed had cheated and that many of these behaviors continued in medical school (Barrett, 1985). It is a reasonable possibility that this pattern of dishonesty may later be expressed in the form of fraudulent behavior while conducting research.

An increasing competitiveness to get an academic job has been documented by Bornstein (1980). Bornstein sampled a group of young psychologists (mean age, 33 yrs) and found that they published 2.2 times as much as their senior counterparts (mean age, 55 yrs) did early in their careers. Furthermore, the younger psychologists began publishing an average of 2.4 years before receiving a doctoral degree, compared with .7 years for the older sample.

Although the pressure to publish may take different forms, many researchers and writers have emphasized the strong relationship between publication rate and promotion and tenure (and to merit pay or salary). Several writers have argued that the pressure to publish research is strong and that it is probably a factor in research fraud (Bobys, 1983; Knight, 1984; Relman, 1989). Researchers have documented their untenured faculty report more stress than tenured faculty (Gmelch, Wilke, & Lovrich, 1986). It is likely that a significant reason for the stress among untenured faculty is the perceived pressure and uncertainty surrounding the granting of their tenure. The importance of research productivity to obtaining tenure is well known by anyone in or close to academia (Altman & Melcher, 1983; Gottfredson, 1978; Petersdorf, 1986; Scott, 1974).

The link between research productivity and salary is also common knowledge among those who are informed about the workings of academia. In a national survey of psychologists, Boice and Myers (1987) reported that 44% of the academic psychologists were concerned and stressed about salary, compared with 21% of the psychologists in private practice. In a factor analysis of a stress survey conducted with academic faculty, it was found that concern about perceiving adequate rewards was an important part of the stress (Gmelch et al., 1986). Consistent with the preceding finding, a survey of more than 1000 faculty revealed that 41% were stressed about the adequacy of their salary to meet their financial needs (Gmelch et al., 1984).

The importance of publishing becomes a source of pressure primar-
illy to the extent that it is difficult to get research published. There is ample evidence that this is the case and, furthermore, that faculty are becoming increasingly prolific, thereby further increasing competition. A survey of researchers from 1965 to 1977 revealed that the average number of publications per year per faculty member increased for the physical scientists and life scientists and decreased for the social scientists (King, McDonald, & Roderer, 1981). Similar trends were revealed in a survey of all of the faculty in Minnesota from 1968 to 1980 (Willie & Stecklein, 1982). There were significant increases in the number of faculty who wrote chapters, books, and journal articles. Although many faculty are becoming more productive, it is becoming increasingly difficult to publish in the prestigious journals. Zuckerman and Merton (1971) reported that there is a decline in the ratio of the number of available pages in the prestigious journals to the number of persons in the social and behavioral sciences. The average rejection rate was 80%. A different survey of 540 journals in the social and behavioral sciences revealed a mean rejection rate of 76% (Mullins, 1977).

Assessments of the quality of research and the amount of productivity occur, not only at the peer review level by the journal editors and grant review committees, but also at the department and campus levels. It is likely that faculty ask how much research is required to get tenure, to get a good salary increase, and so on. However, departmental research requirements are often implicit and misunderstood by faculty (Woof, 1986). Suggestions of bias have also been made concerning the peer review of research reports at the level of journal publication (e.g., Cicchetti & Conn, 1976; Cole, Cole, & Simon, 1981). The problem of evaluating research is further compounded by the diverse opinions as to whether a given outlet is refereed or not refereed: an important factor in the evaluation of quality (Miller & Servan, 1984).

Conducting and publishing research is not only important to tenure, promotion, and salary adjustments, it is also critical in obtaining and maintaining grant funding (Altman & Melcher, 1983; Begley, Hager, & Doherty, 1987; Rensberger, 1977). These observations are supported by a survey of a large number of faculty, the results of which revealed that 50% of the faculty indicated that financial support for research is a significant source of stress (Gmelch et al., 1984). Hence, the competition for grant funds and the research necessary to obtain grants are seen as a source of stress and the possible cause of research fraud (Petersdorf, 1986). Not only is the distribution of funds to individuals linked to research productivity, the distribution of funds to the departments on university campuses is increasingly linked to research productivity, and the amount and number of grants in the department (Wheeler, 1989).

Still another source of stress, which in turn might lead to fraud among university faculty, appears to be a perception of inadequate time to carry on all of the various duties, including research. Two studies have reported that time constraints and work overload are troublesome and conducive to stress (Brown et al., 1986; Gmelch et al., 1986).

We have documented the importance of research productivity to promotion, tenure, salary, and obtaining grants. In addition to conducting research, however, most faculty in college and university settings are expected to teach. If teaching is expected, but research is rewarded, faculty are likely to experience a conflict about how they should allocate their time between these two activities. It has been suggested that faculty are paid to teach but are evaluated on the basis of their scholarly works (Caplo & McGee, 1965). The faculty in one university believed that teaching was the most important activity; however, they realized that research productivity was given the most weight in personnel decisions (Hunter et al., 1980). This dilemma may be especially prominent among junior faculty who are striving for tenure and promotion. They may be most inclined to neglect their teaching duties in order to concentrate on research activities (Silver, 1983). The relative value of research over teaching, as evidenced by salary decisions, is documented in several reports. Each of these studies is based on data obtained from faculty or departmental records, and each shows a closer relationship between research productivity and salary than between teaching effectiveness and salary (Hoyt, 1974; Katz, 1973; Tuckman, Gapinski, & Hagemann, 1977).

Not only are tenure, promotion, salary, and the obtaining of grants important influences that motivate research and create stress, there are other factors and higher level needs that may exert a significant influence. It has been suggested that our collegial self-esteem depends on publishing (Aronson, 1981) and that fraud may be committed occasionally to obtain status and recognition (Garfield, 1987). There is some empirical evidence for these observations. In their factor analy-
sis of a 45-item stress index that was completed by nearly 2000 faculty, Gmelch et al. (1986) reported that recognition was one of the factors that emerged. In a sample of academic and applied psychologists, Boice and Myers (1987) reported that 33% of the academic sample, compared with 5% of the private practice sampled, indicated lack of professional recognition as a source of stress.

In summary, it would appear that many sources of pressure in an academic setting concern the implementation of research. Some of the more obvious include promotion, tenure, salary, and likelihood of obtaining a grant and keeping the grant. Other sources of pressure, however, apparently contribute to stress concerning research productivity among academic faculty. These include the individual’s uncertainty about how his or her research is evaluated and whether it is objectively evaluated, conflicts about how to use sparse time in carrying out teaching duties versus research duties, and the psychological importance of being valued and recognized by peers. In addition to all these factors, it appears to be increasingly difficult to publish research findings, given the high rejection rates, especially in prestigious journals. Any of these stressful circumstances could contribute to an individual scientist’s committing research fraud.

FUTURE DIRECTIONS

This section will be organized along two themes. Most researchers who have addressed future directions in regard to handling academic dishonesty, fraud, or misrepresentation have advocated increased institutional involvement (e.g., committees to oversee various aspects of research integrity). This concept has been referred to as increasing policing mechanisms (Steneck, 1984). An overview of these suggestions will be presented first.

However, a different focus (i.e., often called prevention; Steneck, 1984) could be espoused that advocates a more personal and problem-solving approach before misconduct occurs. The second section will lay out these possibilities. If academic pressures contribute to incidents of fraud or misconduct, both of these foci should be in place to deal with the inherent contingencies in the system.

Policing Mechanisms

Policing mechanisms follow two lines: the establishment of formal policies for research ethics and the swift investigation of reports of fraud or misconduct. The establishment of policies for research ethics is clearly an educative approach. The following excerpt was taken from the University of Michigan Joint Task Force on Integrity of Scholarship and cited by Steneck (1984): “We hope to make clearer not only the types of integrity that are expected, but the contexts in which this integrity applies and should be judged” (p. 8). By having these principles in place, the institution and administration espouse guidelines for researchers that make clear, not only the ethical principles involved in conducting research, but also the institution’s commitment to informing investigators of the appropriate conduct of experiments. Several examples follow.

Researchers need to be informed of the clear policies for retaining data or original records (Engler et al., 1987). Perhaps institutions should go so far as to inform investigators that data may need to be turned over to an appropriate committee for review, should allegations of misconduct surface. Mishkin (1988) suggested, “As a matter of institutional policy, the inability to provide primary data should give rise to a presumption that data do not (and never did) exist” (p. 1933). (However, as Braunwald, [1987], noted, Harvard had a clear policy to retain data and John Darsee did not comply.)

In addition, Mishkin (1988) and Engler et al. (1987) suggested that junior scientists should be supervised. Supervision should include “regular and systematic scrutiny of primary data, in-depth discussion of the analysis of the data, and continuing close personal interaction. There also should be instruction—through both expression and example—about respect for the data, wherever they may lead” (Mishkin, 1988, p. 1933).

A final policy that could be in place would govern the authorship of scientific articles. Several national organizations have such policies including the American Psychological Association and the International Committee of Medical Journal Editors.

However, the institution will need to go at least one step further than the preceding guidelines. Various governmental agencies (e.g. NIH) now require that institutions have misconduct policies in place before grants or contracts are awarded (Powlledge, 1986). Petersdor
(1989) suggested that the guidelines issued by the Association of American Medical Colleges (1982) should serve as a model:

The institution should be able to institute a process of inquiry rapidly and to complete it thoroughly, carefully, fairly, and expeditiously in an atmosphere of total, or at least relative, confidentiality. If a full-scale investigation is warranted, the means for proceeding should be on the books, and the responsibility of the institution, along with the rights of the accuser and the accused, should be clearly understood. At this point, the granting agency, whether public or private, should be informed that an investigation is in progress, but research funding should not be withdrawn until those conducting the investigation conclude that withdrawal is warranted, even though such delay may require the institution at which fraud has been committed to make retrospective restitution. (p. 121)

Finally, some researchers have advocated an atmosphere where the sanctions for confirmed reports of fraud or misconduct are clearly understood (Mishkin, 1988). Sanctions most often only come in the form of "loss of job or reputation . . . because of ignorance of the law or fear of the expense of litigation" (DuBois, 1989, p. 607). However, DuBois (1989) warned that the legal climate is changing and several individuals have been successfully convicted of crimes related to fraud.

To close, Mishkin (1988) suggested that the preceding policies should be incorporated "into student and faculty handbooks along with a statement that students and faculty are expected to be familiar with them and that major deviations are presumed to be intentional" (p. 1933). Also, she suggested that the policies be reviewed with students in laboratory courses. Mishkin (1988) provides an excellent overview of the process of responding to misconduct.

**Prevention**

A great deal of the preceding discussion could have been included in this section. The section on policing mechanisms, however, represents the institution's involvement in the process, and the following discussion will deal primarily with researchers per se.

The earlier discussion suggested personality variables and environmental contingencies that may play a role in leading an investigator to commit fraud or misconduct. Future research and practice should be aimed at addressing these potential mediators to decrease the probability of future occurrences of the questionable behavior.

Several authors have suggested that increased attention should be devoted to ethics training in the research community. An open and systematic discussion of ethics, research design, and so on, and routine inclusion of these issues in publications should help to increase awareness of the issues (DuBois, 1989). Braunwald (1987) also suggested, "It must be understood by all that to be a scientist is a privilege and that society invests a special trust in all scientists. Whenever that trust is abused it diminishes all scientists." (p. 216).

A second area to be revitalized is in the promotion of mentoring efforts. Woolf (1981) suggested that each individual scientist's "internal monitor [is learned from] mentors whose rigor and deliberate guard them against wishful thinking and self-deception. This socialization is an essential component of professional education" (p. 11). This suggestion fits well with the earlier "institutional" requirement of providing supervision for junior scientists.

Another type of contact with other scientists would be to increase collaborative efforts. Woolf (1981) noted:

"Research is highly interdependent; scientists communicate with each other at every stage in the process of investigation. From the inception of an idea for an experiment, to the development of protocols for carrying it out, to interpretation of results and preparation of a manuscript for publication, scientists are in touch with each other, testing their perceptions, ideas, and plans against those of colleagues." (p. 11)

Scientists would feel not only supported in their research efforts but also comfortable seeking out advice on problem issues. Collaborators could check data, computer printouts, graphs, or other research materials for each other (Petersdorf, 1986). Coauthors would also feel more comfortable with the data that are ultimately published. Blakely et al. (1986) suggested that "anyone willing to take credit for data collected by another must be equally willing to share the blame should those data prove fabricated" (p. 327).

In a somewhat different vein, administrators (and specifically chairs of departments) should be more involved in understanding the job strain involved in academic careers (Blackburn, Horowitz,
Edington, & Klos, 1986) and work with faculty to address concerns and facilitate change in the inherent pressure and competition of the job. Individuals who are making promotion and tenure decisions should be more concerned with quality rather than with quantity of research (Steneck, 1984). Angell (1986) suggested limiting the number of publications that are considered for promotion or funding. She suggested three probable effects of this change.

First, the quality of medical research would tend to improve, insofar as each study would receive commensurately more attention. Second, promotions and funding would more accurately reflect the quality of a researcher’s work, because a smaller number of publications would be easier to evaluate. Third, some of the fluff in our huge scientific literature would be eliminated. (p. 262)

Angell (1986) and Boby’s (1983) have also suggested that more weight should be placed on excellence in teaching as a criterion for promotion and tenure decisions. This may “reduce the push for publication that may lead to research fraud” (Boby’s, 1983, p. 47).

Finally, administrators might direct special efforts toward burnout prevention and intervention on faculty development (Dailey & Jeffress, 1983), helping faculty to reduce Type A behaviors (Thurman, 1984, 1985) or restructuring faculty roles to decrease stress (Shull, 1972). This emphasis would be placed on the environmental contingencies that may contribute to fraudulent behavior.

CONCLUSIONS

A number of individuals have suggested that the process of submitting, reviewing, and accepting manuscripts for publication in professional journals should be changed to address some of the issues raised in this chapter. Woolf (1981) suggested that all editors should require authors to sign a statement that data will be available for 5 years postpublication. Reiman (1989) suggested that editors ask coauthors to accept responsibility for the integrity of studies that have been submitted for publication, and Huth (1986) suggested that a footnote include the exact contribution of each author. Engler et al. (1987) believed that tables of data should be submitted to reviewers, even if they are not to be part of the publication, so that reviewers would have more information to assess the representativeness of the data. Huth (1986) has also suggested that authors should be required to affirm that the “essence” of a manuscript has not been accepted for publication or already published elsewhere.

A number of authors have suggested that the scientific endeavor is both self-evaluative as well as self-correcting by nature of the replication of studies. However, during the past two decades, the publication of replications has become rare. Indeed, Engler et al. (1987) noted:

Replication, once an important element in science, is no longer an effective deterrent to fraud because the modern biomedical research system is structured to prevent replication—not to ensure it. It appears to be impossible to obtain funding for studies that are largely duplicative. (p. 1383)

Weinstein (1979) also noted that “the absence of and barriers to replication” (p. 650) is a real problem in the exacerbation of potentially fraudulent work because this self-policing mechanism is absent. Perhaps editors and grant institutions should be more willing to support replication studies.

A number of suggestions have been raised in considering the future directions that we can make to prevent or appropriately deal with fraud or instances of misconduct. DuBois’s (1989) comments are quite cogent in the future assessment and treatment of the problem:

With respect to ethical conduct in research and the reporting thereof, what is required is deliberate effort on the part of scientific and professional organizations to define terms, to consider not a narrower but a wider range of problematic ethical situations, and to determine actual practices as opposed to accepted practices. (p. 611)

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